IT IS THE VENDOR'S RESPONSIBILITY TO CHECK
FOR ADDENDUMS PRIOR TO SUBMITTING PROPOSALS

NOTICE TO BIDDERS
SPECIFICATION NO. 04-053

The City of Lincoln, Nebraska intends to purchase and invites you to submit a sealed bid for:

General Purpose Open Loop Vector AC Drive Motor Control

Sealed bids will be received by the City of Lincoln, Nebraska on or before 12:00 noon Wednesday, February 25, 2004, in the office of the Purchasing Agent, Suite 200 K-Street Complex, 440 South 8th Street, Lincoln, Nebraska 68508. Bids will be publicly opened and read in the Conference Room located on the First Floor.

Bidders should take caution if U.S. mail or mail delivery services are used for the submission of bids. Mailing should be made in sufficient time for bids to arrive in the Purchasing Division, prior to the time and date specified.

Company Name_____

PROPOSAL
SPECIFICATION NO. 04-053

BID OPENING TIME: 12:00 NOON
DATE: February 25, 2004

The undersigned bidder, having full knowledge of the requirements of the City of Lincoln for the below listed items and the contract documents (which include Notice to Bidders, Instructions to Bidders, this Proposal, Specifications, Contract, and any and all addenda) and all other conditions of the Proposal, agrees to sell to the City the below listed items for the performance of this Specification, complete in every respect, in strict accordance with the contract documents at and for unit prices listed below.

ADDENDA RECEIPT: The receipt of addenda to the specifications numbers ____ through ____ are hereby acknowledged. Failure of any bidder to receive any addendum or interpretation of the specifications shall not relieve the bidder from obligations specified in the bid request. all addenda shall become part of the final contract document.

BIDDING SCHEDULE

ITEM	ITEM DESCRIPTION	QUANTITY	UNIT	TOTAL
1.	General Purpose Open Loop Vector AC Drive Motor Control, Saftronics GP10 or City of Lincoln approved alternate.	1 Each	$_____	$_____
2.	This item is subject to 5.5% sales tax rate	1 Each	$_____	$_____
3.	**Total** to include shipping F.O.B. to: Lincoln Water System, Ashland Water Treatment Plant, 401 Hwy 6, P.O. Box 144, Ashland, NE 68003			$_____

BID SECURITY REQUIRED: ____ YES __X__ NO

AFFIRMATIVE ACTION PROGRAM: Successful bidder will be required to comply with the provisions of the City's Affirmative Action Policy (Contract Compliance, Sec. 1.16). The Equal Opportunity Officer will determine compliance or non-compliance with the City's policy upon a complete and substantial review of successful bidder's equal opportunity policies, procedures and practices.

The undersigned signatory for the bidder represents and warrants that he has full and complete authority to submit this proposal to the City, and to enter into a contract if this proposal is accepted.

INTER-LOCAL PURCHASING: The City/County desires to make available to other local government entities of the State of Nebraska, by mutual agreement with the successful bidder, and properly authorized inter-local purchasing agreements, the right to purchase the same services, at the prices quoted, for the period of this contract. Each bidder shall indicated on the Bid Form in the space provided below if he/she will honor Political Subdivision orders in accordance with the contract terms and conditions, in addition to orders from City of Lincoln/Lancaster County.

____YES ____NO

If "YES", Contract supplier or suppliers may honor pricing and extend the contract to political sub-divisions, cities and counties. Terms and conditions of the contract must be met by political sub-divisions, cities and counties. Under no circumstances shall the City of Lincoln/Lancaster County be contractually obligated or liable for any purchases by these political sub-divisions, cities or counties.

COMPANY REPRESENTATIVE responsible for the administration of this Agreement:
NAME:_____
TITLE:_____
PHONE NO._____

RETURN 2 COMPLETE COPIES OF PROPOSAL AND SUPPORTING MATERIAL.
MARK OUTSIDE OF BID ENVELOPE: SEALED BID FOR SPEC. 04-053

COMPANY NAME	**BY (Signature)**
STREET ADDRESS or P.O. BOX	**(Print Name)**
CITY, STATE ZIP CODE	**(Title)**
TELEPHONE	**(Date)**
EMPLOYER'S FEDERAL I.D. NO. OR SOCIAL SECURITY NUMBER	**ESTIMATED DELIVERY DAYS AFTER RECEIPT OF ORDER**

BIDS MAY BE INSPECTED IN THE PURCHASING DIVISION OFFICES DURING NORMAL BUSINESS HOURS, **AFTER** TABULATION BY THE PURCHASING AGENT. IF YOU DESIRE A COPY OF THE BID TABULATION TO BE MAILED TO YOU, YOU MUST ENCLOSE A SELF-ADDRESSED STAMPED ENVELOPE WITH YOUR BIDDING DOCUMENTS.

Specifications
For
General Purpose Open Loop Vector AC Drive Motor Control

1. Acceptable Manufacturer

   1.1 Saftronics GP10

2. General

   2.1 Supplier shall furnish a Drive Motor Control equal to or better than the acceptable manufacturer listed above.

   2.2 Equipment will be used on V.F.D. 100 HP, 147 amp,505 RPM, 3 phase, GZ type, 460 volt, 1.0 Service Factor, Class B Insulation.

   2.3 Existing drive to be replaced:
   - 2.3.1 Auto Con Model PT46V119, factory #204068, 460 Volt, 60 hz, 119 KVA, 150 amp

3. Equipment and Performance Specifications

   3.1 (See Attached) Any alternate brands submitted are required to indicate any variances from the specifications (see Instruction to Bidders, *10. Brand Names*)

   3.2 Bidders are responsible for verifying the compatibility of their drive in the City of Lincoln's application.
   - 3.2.1 Motor and V.F.D. are located in Ashland, Nebraska
   - 3.2.1 Recommend that bidders set up time to view existing equipment and application.

   3.3 Start -up, Testing and Training
   - 3.3.1 The supplier of the motor shall provide a qualified, experienced factory trained technician to program and setup motor.
   - 3.3.2 The supplier of the motor shall provide a minimum of 4 hours on-site training for the Lincoln Water System staff.

   3.4 Local service representative. (100 mile radius from Ashland)

   3.5 Provide 10-year parts availability.

   3.6 Provide drive software and communication cable for programing and trouble-shooting.

   3.7 Provide recommended spare parts list.

   3.8 Guarantee delivery not to exceed 90-days after receipt of order.

   3.9 Variable Frequency Drive shall be oversized 25% above motor nameplate requirement.

   3.10 Drive shall be housed in a NEMA 12 stainless steel enclosure with forced air ventilation, filters over air openings, and adequate space for proper cooling of the drive.

3.11 A control panel including key pad, display, stop/start switch, local-off-remote switch, speed control, and power disconnect switch, shall be located on the front of the enclosure listed above.

3.12 A 4-20 milliamp remote speed control input and 4-20 milliamp remote output speed reference shall be provided.

4. Delivery Information and Contact

4.1 Contact Mr. Larry Mitera or Mr. Paul Wimmer, Assistant Superintendent Control/Electrical, telephone number 402-323-3879 with any technical questions regarding this request.

4.2 Shipping address shall be Lincoln Water System, 401 E. Highway 6, Ashland, NE 68003

Specification

1.0 General

1.1 Purpose

This specification shall establish the minimum requirements for adjustable frequency drive equipment. Drives that do not meet these requirements shall not be acceptable.

1.2 Driven Equipment

The Drive shall be capable of operating a NEMA design B squirrel cage induction motor with a full load current equal to or less than the continuous output range of the Drive. At base speed (60 hertz) and below, the Drive shall operate in constant volts per hertz mode. Above base speed (60 hertz), the Drive may selectively operate in either a constant volt per hertz mode or a constant voltage extended frequency mode.

1.3 Drive Construction

The adjustable frequency Drive shall be a sinusoidal PWM type Drive with sensor-less Dynamic Torque Vector Control capability. The Drive shall be provided in a NEMA 1 enclosure at all ratings. NEMA 4 enclosures shall be available up to 15 HP ratings, NEMA 12 enclosures shall be available for 15 through 30 HP ratings, and IP00 enclosures shall be available for 40 HP and above. The Drive shall be of modular construction for ease of access to control and power wiring, and maintenance. It shall consist of the following general components:

1.3.1 Full wave diode rectifier to convert supply AC to a fixed DC voltage.

1.3.2 DC link capacitors

1.3.3 Insulated Gate Bipolar Transistor (IGBT) power section, for variable torque applications. The power section shall use vector dispersal pulse width modulated (PWM) control and soft switching IGBTs to reduce noise and allow longer cable length from drive to motor.

1.3.4 The Drive shall be microprocessor based with an LED and LCD display to monitor operating conditions. The Drive display section shall allow for local operation and setting of Drive function codes and display fault indication and reasons associated with the fault. The LED display shall offer nine (9) different display settings and the LCD shall have the capacity to display five (5) lines of information at a time.

1.3.5 Separate control and power terminal boards, with option plug shall be provided by the drive to allow for remote operation.

1.3.6 The Drive shall have an RS485 port as a standard and options for communicating with recognized industry standard device level networks such as DeviceNet, Interbus-S, Profibus, Modbus Plus, LonWorks and Metasys N2.

1.3.7 The keypad shall be capable of copying, uploading and downloading Drive function codes.

2.0 Operating Conditions

2.0.1 The Drive's operating ambient temperature range shall be -10°C to 50°C. Storage temperatures shall be between -25°C to 65°C.

2.0.2 The relative humidity range shall be 5-95% non-condensing.

2.0.3 The Drive shall be suitable for operation at altitudes up to 3300 feet without de-rating.

2.0.4 The Drive shall meet IEC 61200-2 for vibration levels.

2.0.5 The Drive shall be capable of side-by-side insulation with zero clearance at 30 HP and below.

3.0 Standards

3.0.1 The Drive shall be UL and cUL listed and not require external fuses. The Drive shall also be CE labeled and comply with standards EN 61800-3 for EMC compliance and EN 61800-2 for low voltage compliance.

3.0.2 The Drive shall be designed in accordance with applicable portions of NEMA standards.

3.0.3 The Drive shall be compatible with the installation requirements of interpretive codes such as National Electric Code (NEC) and Occupational Safety & Health Act (OSHA).

3.0.4 The Drive shall be capable of operating in compliance with IEEE 519-1992.

4.0 Input Power

4.0.1 The Drive design shall be such that it will be available for use either with 200-230 or 380-480 VAC, 3-phase power input.

4.0.2 The Drive shall be able to withstand voltage variations of -15% to +10% and imbalance no greater than 3% without tripping or affecting Drive performance.

4.0.3 System frequency shall be 50 or 60 Hertz with a maximum frequency variation of ±5%.

4.0.4 The displacement power factor of the Drive shall be 0.95 lagging or higher with the use of a DC reactor. (Note: Displacement power factor is not the same as the actual power factor.)

4.0.5 Drive efficiency at rated load shall be 96% or higher depending on Drive's operating carrier frequency and rating.

4.0.6 Line notching, transients, and harmonics on the incoming line shall not affect Drive performance.

4.0.7 The Drive shall have provisions to add a DC Link Inductor, if required by the installation but not for the Drive's operation (less than 100 Hp). Ratings 100 Hp and above shall be supplied with a DC Link Inductor.

5.0 Output Power

5.0.1 The Drive shall be capable of horsepower ratings from fractional through 600 HP (variable torque) and output frequencies up to 120 Hertz. It shall also have an energy saver feature with the capability of selecting a V/Hz automatic control function that will modify the V/Hz curve based on light load characteristics that will minimize power consumption.

5.0.2 Drive output voltage shall vary with frequency to maintain a constant volts/hertz ratio up to base speed (60 hertz) output. Constant or linear voltage output shall be supplied at frequencies greater than base speed (60 hertz).

5.0.3 Rated output voltage shall be programmable for motor ratings from 180 to 240 volts, or from 320 to 480 volts.

5.0.4 The Drive shall be capable of a minimum of 100% rated current in continuous operation, in accordance with the requirements of NEC Table 430-150.

5.0.5 The Drive one minute overload current rating shall be 110% of rated current for Variable Torque applications and 150% for Constant Torque applications.

6.0 Drive Features

6.0.1 The Drive shall have a graphic back-lit liquid crystal display (LCD) which can be configured to display frequency, current, function code set points, or Drive status and fault codes. It shall display 4 lines with 13 characters of text, providing display of:

Programming Mode: Function Code Numbers, Set points, and Status.
Diagnostic Mode: Fault Indication Codes. (See Section 9.1)
I/O Check Mode: Analog and digital input/output signal status.
Copy Function Mode: Function Data Copy.

6.0.2 The Drive shall display operating data, fault information, and programming prompts in English with graphic representations of functions where applicable. The Drive shall have six (6) different language LCD readout capabilities (English, French, German, Italian, Spanish, and Japanese).

6.0.3 The drive shall have four digital LED readouts, providing display of: Output Current, Output Voltage, Output Frequency, Frequency Reference, Motor Synchronous Speed (adjustable for 2 to 12 pole motors), Line Speed (calibration adjustable from 0 to 200% of frequency, with 0.01% resolution), kW power consumption, PID setting value, PID remote set value, PID feedback value, and Torque calculations value.

6.0.4 The Drive shall also have a built in keypad that shall be extendible, by optional cable, to a remote location up to 32 feet (10 m) from the Drive. The keypad shall include the following buttons, allowing 3 modes of operation: Forward/Reverse/Stop/Jog keys, Drive reset key, Reference increment/decrement keys

6.0.5 The Drive shall be capable of remote mounting with simple connection to the keypad or via an RS485 serial port.

6.0.6 Upon a fault condition, the LCD shall display Drive current, voltage, frequency, torque, DC link voltage, operating hours, I/O terminal status, and temperature at the time of fault. The last four (4) faults will be stored in memory and selectively be displayed on the LCD.

6.0.7 Unless the application requires it, the Drive shall operate as an open-loop control system requiring no feedback devices.

6.0.8 The Drive shall accept and follow a selectable external frequency reference of either analog 0-5 VDC, 0±10 VDC, 4-20mA with signal inversion.

6.0.9 The Drive shall maintain the output frequency to within 0.2% of reference when the reference is analog, and to within .01% of reference when the reference is digital (Speed level inputs from keypad, contact closure or digital interface).

6.0.10 The Drive shall maintain set frequency regardless of load fluctuations.

6.0.11 The Drive shall be capable of at least 4 different acceleration rates and 4 different deceleration rates. Each acceleration and deceleration rate shall be independently adjustable from 0.01 to 3600 seconds.

6.0.12 The Drive will have a default starting torque of 50% with adjustment to 120% when the Dynamic Torque Vector Control function is activated.

6.0.13 The Drive will have the capability of determining motor characteristics to optimize its operation through the use of pre-programmed motor data information or self-tuning operation where the Drive can determine the motor characteristics initially.

6.0.14 The Drive shall allow the user to select whether the shaft does or does not move during auto-tune.

6.0.15 The Drive Auto-tune will include an online mode that automatically and dynamically compensates the drive's regulator for changes in motor temperature.

6.0.16 The Drive shall offer three selectable acceleration/deceleration patterns: linear, S-curve, and non-linear for variable torque loads.

6.0.17 The drive shall have selectable torque (voltage) boost settings that will enable smooth acceleration of high inertia or high static friction type loads during starting. One level will allow for automatic calibration that will compensate for the ac motor's primary resistance (IR compensation); one level is to be set for variable torque loads; one level is to be for proportional torque loads where torque is directly related to set speed, or for constant torque loads. A second Torque Boost function setting is to be available for a 2nd motor with different characteristics and/or set of operating requirements.

6.0.18 The Drive shall have a selectable Automatic Torque Boost function that will adjust motor torque based on the operating load conditions.

6.0.19 All Drive Operating Function Codes shall be stored in non-volatile memory (EEPROM). Potentiometer adjustments are not required nor allowed. The Drive will have a default set of Function Code settings.

6.0.20 The Drive shall have adjustable switching frequency settings ranging from 0.75 kHz to 15 kHz to limit and adjust the level of audible motor noise.

Ranges:		
	Up to 30 HP	0.75 -15 kHz
	30 to 100 HP	0.75- 10 kHz
	125 HP and greater	0.75 - 6 kHz

6.0.21 The Drive shall be able to operate with its output disconnected for troubleshooting and startup.

6.0.22 The Drive shall have a reference filter that eliminates the effects of noise that may be present in the analog signals.

6.0.23 The Drive shall have a selectable function to prevent reverse operation of the drive.

6.0.24 The Drive shall be able to reset itself up to ten (10) times (adjustable with adjustable intervals of 2-20 seconds) after over-current, over-voltage, overheating, and overload faults.

6.0.25 The Drive shall be able to operate after a voltage dip below 175 VAC on 230 VAC input power and 310 VAC on 460 VAC input power for 15 milliseconds at 85% full load current without any disturbances in output power delivered to the load. If power exceeds this level, six (6) different modes or active and inactive restart modes will be available. The decrease in motor speed will be adjustable in the event of a momentary power outage.

6.0.26 The Drive shall have a programmable start frequency, adjustable from 0.1 to 60 hertz, with a 1 hertz resolution (refer to 7.9), with a holding time adjustable from 0.1 to 10 seconds.

6.0.27 The Drive shall have the ability to operate in a sensor-less, dynamically controlled torque vector mode for applications that require improved motor speed control and operating characteristics.

6.0.28 The Drive shall have IGBT soft switching and a low noise control power supply system to reduce the noise from the drive.

7.0 Speed Control

7.1 Drive base frequency shall be programmable 25 to 120 hertz with 1 hertz resolution, and the maximum frequency shall be programmable from 50 to 120 hertz, both with 1 hertz resolution.

7.2 The Drive shall have both low frequency limit and high frequency limit functions. Each will be programmable from 0 to 120 hertz with 1Hz resolution.

7.3 The Drive shall have a frequency bias (starting frequency) function programmable from -120 to +120 Hz of maximum frequency, with 0.1 Hz resolution.

7.4 Drive frequency gain shall be programmable from 0-200%, with 0.1% resolution.

7.5 The Drive shall be capable of at least fifteen (15) independently programmable preset frequencies, adjustable from 0.00 to 120.00 hertz.

7.6 The Drive shall be capable of selectable operation in Pattern (programmed cycles) Operation using up to the fifteen (15) preset speeds with at least seven (7) independently programmable timers with an adjustment range of 0.00 to 6000 seconds, four acceleration and deceleration ramp rates, as well as a hold command at set frequency and a reset command to restart the programmed cycle.

7.7 The Drive shall be capable of motor slowdown or stop by selectable regenerative (to the DC link) dynamic braking while following one of the four selectable deceleration ramps, and control the braking torque by setting it's value from 0, 20 to 150%, 999 (no limit) of Drive rating. It will also be capable of changing the rate of deceleration automatically by stopping the braking action long enough to avoid Drive over-voltage trip.

7.8 The Drive shall be capable of starting into a rotating load (forward or reverse) and shall smoothly accelerate or decelerate to the set point without experiencing component damage.

7.9 The Drive shall be capable of stopping by selectable DC injection braking. It shall be adjustable from 0 to 100% braking level and have a programmable starting frequency for DC braking (0.2-60 hertz) and programmable braking time (0.1 to 30.0 seconds).

7.10 The Drive shall have a start Frequency Setting that incorporates a Holding Time at the Frequency Setting, adjustable up to 10 seconds in duration.

7.11 The Drive shall provide at least three selectable skip frequencies with programmable band widths, adjustable 0 to 30 Hz, which will not allow operation at or near mechanical resonance speeds.

7.12 The Drive shall provide selectable slip compensation, which will sense output current and adjust output frequency, to improve motor speed fluctuations. This will allow approximately 1% or less (depending in the slip value selected) speed regulation without the use of a speed feedback device. This function is to be adjustable over a range of 0 to 15.00 Hz.

7.13 The Drive shall have Droop operation, balancing drooping characteristics to speed and load variations. This function shall be adjustable from –9.9 to 0.0 Hz.

7.14 The Drive shall be constructed to support external signals, whether variable reference or discrete inputs, from distances up to 66 feet when proper cable is used.

7.15 Required Drive performance criteria includes:

Frequency Control Range:	0.1 to 120 Hertz	
Frequency Stability:	Digital reference:	± 0.01 % of maximum frequency
	Analog reference:	± 0.2 % of maximum frequency
Frequency Resolution:	Digital reference:	0.01 Hz at max. frequency up to 99.99 Hz
		0.1 Hz at max. frequency 100 Hz and above
	Analog reference:	1/3000 at max. frequency

8.0 Drive Control & Options

8.1 The Drive shall accept inputs from external dry contacts for the following functions:

8.1.1 Run forward command
8.1.2 Run reverse command
8.1.3 Multi-step frequency selection
8.1.4 Acceleration/Deceleration time selection
8.1.5 Stop command
8.1.6 Coast to stop command
8.1.7 Alarm reset
8.1.8 Trip command (external fault)
8.1.9 Jogging operation
8.1.10 Frequency setting 2 and Frequency setting 1
8.1.11 Motor 2 and Motor 1 setting
8.1.12 DC brake command
8.1.13 Torque limiter 2 and Torque limiter 1
8.1.14 Switching operation between line and inverter (50 and 60 Hz)
8.1.15 Speed Increase command
8.1.16 Speed Decrease command
8.1.17 Write enable for keypad
8.1.18 PID control cancel
8.1.19 Inverse mode changeover
8.1.20 Interlock signal
8.1.21 Link enable
8.1.22 Universal DI
8.1.23 Pick up start mode
8.1.24 Forced stop command
8.1.25 Forced stop command with Deceleration time

8.2 The Drive shall be capable of selectable external start/stop control, either 2-wire or 3-wire type.

8.3 The frequency reference shall be from, selectively, an external speed potentiometer, external analog signals (0-5 VDC, 0±10 VDC, 4 to 20mA with signal inversion), from the built in keypad, or from bus communication.

8.4 The Drive shall provide an adjustable (to a maximum of 0-200% / 10.3 VDC) analog output and a frequency pulse output. The analog output shall be selectively proportional to either output frequency (before or after slip compensation), output current, output voltage, output torque, load factor, input power, PID feedback value, tachometer feedback value, DC link voltage. The frequency pulse output shall be suitable for both an analog meter indication as well as digital frequency indication.

8.5 The Drive shall provide selectable outputs indicating the following:

8.5.1. Four (4) Programmable digital open collector outputs and a dry contact output for:

8.5.1.1 Inverter running
8.5.1.2 Frequency equivalence signal
8.5.1.3 Frequency level detection
8.5.1.4 Torque polarity
8.5.1.5 Torque limiting
8.5.1.6 Auto-restarting
8.5.1.7 Overload early warning
8.5.1.8 Keypad operation mode
8.5.1.9 Inverter stopping
8.5.1.10 Ready input
8.5.1.11 Line/Inverter changeover
8.5.1.12 Motor 2 / Motor 1
8.5.1.13 Auxiliary terminal
8.5.1.14 Time-up signal
8.5.1.15 Cycle completion time
8.5.1.16 Stage No Indication (1, 2, and 4)
8.5.1.17 Alarm Indication (1, 2, 4, and 8)
8.5.1.18 Fan operation signal
8.5.1.19 Auto resetting
8.5.1.20 Universal DO
8.5.1.21 Overheat early warning
8.5.1.22 Second frequency level detection
8.5.1.23 Second overload early warning
8.5.1.24 Terminal C1 off signal

8.5.2 Transistor output (Y1 to Y4) are either sink or source operation.

8.6 The Drive shall be compatible with the LonWorks, Metasys N2, DeviceNet, PROFIBUS-DP, MODBUS Plus, and INTERBUS-S by an option card and allow for communication interface either directly or via third party interface boards.

8.7 The Drive keypad shall have the capability to store Function Codes that are either preset, internal, or are operational code settings used for a specific application. The keypad shall be able to download function codes into other drives.

9.0 Protective and Diagnostic Features

9.1 When a fault occurs, the Drive shall have a controlled shut down sequence. The reason for the fault condition shall be enunciated on the LED display, and the LCD graphic screen shall display the current, temperature, frequency, and voltage at the time of the fault as well as potential reasons for the condition. The Drive shall monitor, sense, and display the following fault conditions:

9.1.1 Over-current during acceleration
9.1.2 Over-current during deceleration
9.1.3 Over-current during constant speed operation
9.1.4 Ground fault

9.1.5 Input phase loss
9.1.6 Fuse blown
9.1.7 Over-voltage during acceleration
9.1.8 Over-voltage during deceleration
9.1.9 Over-voltage during constant speed operation
9.1.10 Under-voltage
9.1.11 Overheating of heatsink
9.1.12 External thermal relay
9.1.13 Over-temperature of internal air
9.1.14 Overheating at Dynamic Braking circuit
9.1.15 Motor 1 overload
9.1.16 Motor 2 overload
9.1.17 Inverter unit overload
9.1.18 Over-speed
9.1.19 Memory Error
9.1.20 Keypad panel communication error
9.1.21 CPU error
9.1.22 Option error (quantity 2)
9.1.23 Operational procedure error
9.1.24 Output wiring error / Impedance imbalance
9.1.25 Modbus-RTU error

9.2 The Drive shall have a selectable Torque Limiting function for both motoring and braking that will sense an overload condition and will reduce frequency and current temporarily until the load reaches acceptable levels. If the overload condition is not settled in the proper amount of time, the Drive will trip on overload. The Torque Limiting shall be programmable from 20-150% of Drive rated motor torque (30 HP an below) and from 20-150% of Drive rated motor torque (40 HP and above), with 1% resolution.

9.3 The Drive shall have a selectable electronic inverse time thermal overload function as required by NEC and UL Standard 991 for an AC Induction Motor (Refer to applicable codes for specific installation requirements). The overload shall be programmable from 20 - 135% of Drive rated current.

9.4 The Drive shall have an over-voltage protection function that operates if supply voltage rises above rated value or by motor's regeneration.

9.5 The Drive shall treat short circuits in either the output load or the output module as an over-current.

9.6 If the Drive heat sink temperature exceeds approximately 100^{o}C, the Drive will shut down on over temperature fault.

9.7 The Drive shall provide output ground fault protection.

9.8 The Drive shall provide LED indication of DC bus voltage, which, when lit, will signify to maintenance people the presence of potentially dangerous voltage.

10.0 Quality Assurance

10.1 All Drives shall be 100% factory tested to ensure proper performance upon delivery.

10.2 The Drive vendor shall provide a warranty for material and workmanship, for a period of twelve months after start up or 18 months after shipment, whichever occurs first.

10.3 11.0 Start-Up Service and Training

Drive operational and maintenance training and/or startup service shall be offered by the Drive vendor separately. The Drive vendor shall have factory trained personnel at field locations convenient to the installation site, available for trouble shooting and/or startup assistance.

12.0 Documentation

An instruction manual, complete with wiring diagrams, schematics, operating, and maintenance instructions, shall be provided with the Drive at the time of shipment.

13.0 Spare Parts

Spare parts shall be available locally through local stocking distributors.

INSTRUCTIONS TO BIDDERS

CITY OF LINCOLN, NEBRASKA
PURCHASING DIVISION

1. BIDDING PROCEDURE

1.1 Bidder shall submit two (2) complete sets of the bid documents and all supporting material. All appropriate blanks shall be completed. Any interlineation, alteration or erasure on the specification document shall be initialed by the signer of the bid. Bidder shall not change the proposal form nor make additional stipulations on the specification document. Any amplified or qualifying information shall be on the bidder's letterhead and firmly attached to the specification document.

1.2 Bid prices shall be submitted on the Proposal Form included in the bid document.

1.3 Bidders may submit a bid on an "all or none" or "lump sum" basis, but should also submit a quotation on an item-by-item basis. Bidding documents shall be clearly marked indicating the kind of proposal being submitted.

1.4 Each bid must be legibly printed in ink or by typewriter, include the full name, business address, and telephone number of the bidder; and be signed in ink by the bidder.

1.5 A bid by a firm or organization other than a corporation must include the name and address of each member.

1.6 A bid by a corporation must be signed in the name of such corporation by a duly authorized official thereof.

1.7 Any person signing a bid for a firm, corporation, or other organization must show evidence of his authority so to bind such firm, corporation, or organization.

1.8 Bids received after the time and date established for receiving bids will be rejected.

2. BIDDER'S SECURITY

2.1 Bid security, as a guarantee of good faith, in the form of a certified check, cashier's check, or bidder's bond, may be required to be submitted with this bid document, as indicated of the Proposal Form.

2.2 If alternate bids are submitted, only one bid security will be required, provided the bid security is based on the amount of the highest gross bid.

2.3 Such bid security will be returned to the unsuccessful bidders when the award of bid is made.

2.4 Bid security will be returned to the successful bidder(s) as follows:

2.4.1 For single order bids with specified quantities: upon the delivery of all equipment or merchandise, and upon final acceptance by the City.

2.4.2 For all other contracts: upon approval by the City of the executed contract and bonds.

2.5 City shall have the right to retain the bid security of bidders to whom an award is being considered until either:

2.5.1 A contract has been executed and bonds have been furnished.

2.5.2 The specified time has elapsed so that the bids may be withdrawn.

2.5.3 All bids have been rejected.

2.6 Bid security will be forfeited to the City as full liquidated damages, but not as a penalty, for any of the following reasons, as pertains to this specification document:

2.6.1 If the bidder fails to deliver the equipment or merchandise in full compliance with the accepted proposal and specifications.

2.6.2 If the bidder fails or refuses to enter into a contract on forms provided by the City, and/or if the bidder fails to provide sufficient bonds or insurance within the time period as established in this specification document.

3. EQUAL OPPORTUNITY

3.1 Each bidder agrees that it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, ancestry, disability, age, or marital status. Bidder shall fully comply with the provisions of Chapter 11.08 of the Lincoln Municipal Code.

3.2 Successful bidder will be required to comply with the provisions of the City's Affirmative Action Policy (Contract Compliance, Sec. 1.16).

3.3 The Equal Opportunity Officer will determine compliance or non-compliance with the City's Affirmative Action Policy upon a complete and substantial review of successful bidder's equal opportunity policies, procedures and practices.

4. DATA PRIVACY

4.1 Bidder agrees to abide by all applicable State and Federal laws and regulations concerning the handling and disclosure of private and confidential information concerning individuals and corporations as to inventions, copyrights, patents and patent rights.

4.2 The bidder agrees to hold the City harmless from any claims resulting from the bidder's unlawful disclosure or use of private or confidential information.

5. BIDDER'S REPRESENTATION

5.1 Each bidder by signing and submitting a bid, represents that the bidder has read and understands the specification documents, and the bid has been made in accordance therewith.

5.2 Each bidder for services further represents that the bidder is familiar with the local conditions under which the work is to be done and has correlated the observations with the requirements of the bid documents.

6. INDEPENDENT PRICE DETERMINATION

6.1 By signing and submitting this bid, the bidder certifies that the prices in this bid have been arrived at independently, without consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder prior to bid opening directly or indirectly to any other bidder or to any competitor; no attempt has been made, or will be made, by the bidder to induce any person or firm to submit, or not to submit, a bid for the purpose of restricting competition.

7. CLARIFICATION OF SPECIFICATION DOCUMENTS

7.1 Bidders shall promptly notify the Purchasing Agent of any ambiguity, inconsistency or error which they may discover upon examination of the specification documents.

7.2 Bidders desiring clarification or interpretation of the specification documents shall make a written request which must reach the Purchasing Agent at least seven (7) calendar days prior to the date and time for receipt of bids.

7.3 Interpretations, corrections and changes made to the specification documents will be made by written addenda.

7.4 Oral interpretations or changes to the Specification Documents made in any other manner, will not be binding on the City; and bidders shall not rely upon such interpretations or changes.

8. ADDENDA

8.1 Addenda are written instruments issued by the City prior to the date for receipt of bids which modify or interpret the specification document by addition, deletion, clarification or correction.

8.2 Addenda will be mailed or delivered to all who are known by the City to have received a complete set of specification documents.

8.3 Copies of addenda will be made available for inspection at the office of the Purchasing Agent.

8.4 No addendum will be issued later than forty-eight (48) hours prior to the date and time for receipt of bids, except an addendum withdrawing the invitation to bid, or an addendum which includes postponement of the bid.

8.5 Bidders shall ascertain prior to submitting their bid that they have received all addenda issued, and they shall acknowledge receipt of addenda on the proposal form.

9. ANTI-LOBBYING PROVISION

9.1 During the period between the bid close date and the contract award, bidders, including their agents and representatives, shall not directly discuss or promote their bid with any member of the City Council or City Staff except in the course of City-sponsored inquiries, briefings, interviews, or presentations, unless requested by the City.

10. BRAND NAMES

10.1 Wherever in the specifications or proposal form brand names, manufacturer, trade name, or catalog numbers are specified, it is for the purpose of establishing a grade or quality of material only; and the term "or equal" is deemed to follow.

10.2 It is the bidder's responsibility to identify any alternate items offered in the bid, and prove to the satisfaction of the City that said item is equal to, or better than, the product specified.

10.3 Bids for alternate items shall be stated in the appropriate brand on the proposal form, or if the proposal form does not contain blanks for alternates, bidder MUST attach to the specification documents on Company letterhead a statement identifying the manufacturer and brand name of each proposed alternate, plus a complete description of the alternate items including illustrations, performance test data and any other information necessary for an evaluation. The bidder must indicate any variances by item number from the specification document no matter how slight. Bidder must fully explain the variances from the specification document, since brochure information may not be sufficient.

10.4 If variations are not stated in the proposal, it will be assumed that the item being bid fully complies with the City's specifications.

11. DEMONSTRATIONS/SAMPLES

11.1 Bidders shall demonstrate the exact item(s) proposed within seven (7) calendar days from receipt of such request from the City.

11.2 Such demonstration can be at the City delivery location or a surrounding community.

11.3 If bidder does not have an item in the area, it will be at the bidder's expense to send appropriate City personnel to the nearest location to view and inspect proposed item(s).

11.4 If items are small and malleable, and the bidder is proposing an alternate product, the bidder MUST supply a sample of the exact item. Samples will be returned at bidder's expense after receipt by the City of acceptable goods. Bidders must indicate how samples are to be returned.

12. DELIVERY

12.1 Each bidder shall state on his proposal form the date upon which he can make delivery of all equipment or merchandise. Time required for delivery is hereby made an essential element of the bid.

12.2 The City reserves the right to cancel orders, or any part thereof, without obligation, if delivery is not made within the time(s) specified on the proposal form.

12.3 All bids shall be based upon **inside** delivery of the equipment or merchandise F.O.B. the City at the location specified by the City, with all transportation charges paid.

13. WARRANTIES, GUARANTEES AND MAINTENANCE

13.1 Copies of the following documents must accompany the bid proposal for all items being bid:

13.1.1 Manufacturer's warranties and/or guarantees.

13.1.2 Bidder's maintenance policies and associated costs.

13.2 As a minimum requirement of the City, the bidder will guarantee in writing that any defective components discovered within a one (1) year period after the date of acceptance shall be replaced at no expense to the City. Replacement parts of defective components shall be shipped at no cost to the City. Shipping costs for defective parts required to be returned to the bidder shall be paid by the bidder.

13.3 Bidder Warrants and represents to the City that all software/firmware/ hardware/equipment /systems developed, distributed, installed or programmed by Bidder pursuant to this Specification and Agreement.

13.3.1 That all date recognition and processing by the software/firmware/hardware/equipment/system will include the four-digit-year format and will correctly recognize and process the date of February 29, and any related data, during Leap years; and

13.3.2 That all date sorting by the software /firmware/hardware/ equipment/system that includes a “year category” shall be done based on the four-digit-year format. Upon being notified in writing by the City of the failure of any software/ firmware/ hardware /equipment /systems to comply with this Specification and Agreement, Contractor will, within 60 days and at no cost to the City, replace or correct the non-

complying software/ firmware/ hardware/ equipment/ systems with software/firmware/ hardware/equipment/ systems that does comply with this Specification and Agreement.

13.3.3 No Disclaimers: The warranties and representations set forth in this section 13.3 shall not be subject to any disclaimer or exclusion of warranties or to any limitations of Licensor's liability under this Specification and Agreement.

14. ACCEPTANCE OF MATERIAL

14.1 All components used in the manufacture or construction of materials, supplies and equipment, and all finished materials, shall be new, the latest make/model, of the best quality, and the highest grade workmanship.

14.2 Material delivered under thisproposal shall remain the property of the bidder until:

14.2.1 A physical inspection and actual usage of this material is made and found to be acceptable to the City; and

14.2.2 Material is determined to be in full compliance with the specifications and accepted proposal.

14.3 In the event the delivered material is found to be defective or does not conform to the specification documents and accepted proposal, then the City reserves the right to cancel the order upon written notice to the bidder and return materials to the bidder at bidder's expense.

14.4 Successful bidder shall be required to furnish title to the material, free and clear of all liens and encumbrances, issued in the name of the City of Lincoln, Nebraska, as required by the specification documents or purchase orders.

14.5 Selling dealer's advertising decals, stickers or other signs shall not be affixed to equipment. Vehicle mud flaps shall be installed blank side out with no advertisements. Manufacturer's standard production forgings, stampings, nameplates and logos are acceptable.

15. BID EVALUATION AND AWARD

15.1 The signed bid proposal shall be considered an offer on the part of the bidder. Such offer shall be deemed accepted upon issuance by the City of purchase orders, contract award notifications, or other contract documents appropriate to the work.

15.2 No bid shall be modified or withdrawn for a period of sixty (60) calendar days after the time and date established for receiving bids, and each bidder so agrees in submitting the bid.

15.3 In case of a discrepancy between the unit prices and their extensions, the unit prices shall govern.

15.4 The bid will be awarded to the lowest responsive, responsible bidder whose proposal will be most advantageous to the City, and as the City deems will best serve their requirements.

15.5 The City reserves the right to accept or reject any or all bids; to request rebids; to award bids item-by-item, by groups, or "lump sum"; to waive irregularities and technicalities in bids; such as shall best serve the requirements and interests of the City.

16. INDEMNIFICATION

16.1 The bidder shall indemnify and hold harmless the City, its members, its officers and employees from and against all claims, damages, losses, and expenses, including, but not limited to attorney's fees arising out of or resulting from the performance of the contract, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property other than goods, materials and equipment furnished under this contract) including the loss or use resulting therefrom; is caused in whole or part by any negligent act or omission of the bidder, any subcontractor, or anyone directly or indirectly employed by any one of them or anyone for whose acts made by any of them may be liable, regardless of whether or not it is caused by a party indemnified hereunder.

16.2 In any and all claims against the City or any of its members, officers or employees by an employee of the bidder, any subcontractor, anyone directly or indirectly employed by any of them or by anyone for whose acts made by any of them may be liable, the indemnification obligation under paragraph 16.1 shall not be limited in any way by any limitation of the amount or type of damages, compensation or benefits payable by or for the bidder or any subcontractor under worker's or workmen's compensation acts, disability benefit acts or other employee benefit acts.

17. TERMS OF PAYMENT

17.1 Unless other specification provisions state otherwise, payment in full will be made by the City within thirty (30) calendar days after all labor has been performed and all equipment or other merchandise has been delivered, and all such labor and equipment and other materials have met all contract specifications.

18. LAWS

18.1 The Laws of the State of Nebraska shall govern the rights, obligations, and remedies of the Parties under this proposal and any agreement reached as a result of this process.